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ABSTRACT

This study was conducted to determine whether the administration of translation of an English language, teacher attitude test to teachers of other cultures would measure the same things as does its English original. The Minnesota Teacher Attitude Inventory (MTAI) was given to 509 French Canadian elementary school teachers, and the factor structure of their responses was compared to the five factors of the MTAI identified by Yee and Fruchter as defining the inventory's construct validity. Neither empirical techniques nor subjective comparison showed any perfect correspondence between the factor structures of attitudes of the two cultures. The subjective comparison, which indicated a better correspondence, showed that nearly fifty percent of the contents were common to the two cultures. (Author/MB)

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COMPARING ATTITUDES OF TEACHERS IN TWO DIFFERENT CULTURES

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The Minnesota Teacher Attitude Inventory (MTAI) developed by Cook, Leeds, and Callis (1951) is the most popular and as shown in various researches it is best indicant of teachers' attitudes toward children available in published form. Callis (1953) conducted a study to test the efficiency of the MTAI for predicting interpersonal relations in the classroom. He found that the MTAI can predict the kind of interpersonal relations which will exist in the classroom about as well as one can predict academic performance by use of intelligence tests.

The MTAI has been translated in other languages representing different cultures. But the question arises, does it measure the same thing after translation as its English version? In other words, are the attitudes of teachers in different cultures similar? Or, are the attitudes of teachers in different cultures comparable when measured by the same instrument?

In research literature there is evidence that an instrument which is good for one culture may not be so for another culture after its contents have been translated, Bhushan (1967,74). Therefore, it is suspected that it may be true in the case of MTAI also.

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French version of MTAI is available in published form which is meant to measure the attitudes of teachers in French culture. But so far no attempt is made to find out what does it measure? Or, is it equivalent or different to its English version? It was intended to answer such questions in this study. But to answer such questions one should have available comparable data of the two cultures.

To find out the dimensions of teacher attitudes as measured by MTAI, Yee and Fruchter (1971) conducted a study. They came up with five significant factors which are similar to the factor structure of Horn and Morrison (1965). As the subjects in this study were in-service teachers with an average of about 10 years of teaching experience, the authors claim that the five factors may be considered more stable than if they were based on the responses of pre-service candidates as in the case of Horn and Morrison's study. They also claim that the inventory's construct validity can be clearly defined and is verifiable through the five factors.

In this study comparable data were collected for the teachers in French culture and then compared with its English counterpart. More specifically, the purpose of this study was to compare the five factors of MTAI of Yee and Fruchter's study with the factor structure of the attitudes of French Canadian teachers as measured by the French version of MTAI, and to note the differences between the attitudes of teachers of the two cultures.

METHOD

To find out the dimensions of the French version of MTAI, a stratified random sample of 39 elementary schools representing the major geographical regions of the Province of Quebec was taken. Five schools refused to participate for one reason or the other. The remaining 34 schools had 605 teachers, of whom 509 responded the inventory (the others were absent on the particular day, or declined to participate).

The responses of the 509 teachers were scored with a new logical scoring key (Yee and Kriewall, 1969). This key provides a five-step set of weights per item for the range from most favorable to least favorable response, i.e., +2, +1, 0, -1, -2, and ranges from a possible top score of +300 to a bottom score of -300 on the resulting scale. The authors claim that the new key was found to provide slightly higher internal consistency, equivalent validity with pupils' and principals' ratings used as criteria, and a frequency distribution that was not significantly skewed with a greater spread of extreme scores than the original key.

The responses to the 150 items were inter-correlated and factor-analyzed with the help of Biomedical Computer Program, version 1973. Five factors were extracted and were compared with the five factors of the English version. Two empirical procedures for comparing the factors were used. One procedure was developed by Evans (1971) for the transformation of factor matrices to achieve congruence. Suppose matrix A is the factor matrix of Yee and Fruchter's study and matrix B is the factor matrix of the present study. Factor matrix A was treated as the

standard or target matrix while an orthogonal transformation of B was found so that the transformed matrix is as much like the target, A, as possible. The values of the congruence coefficients give an indication of the degree of correspondence between the factors of the target matrix and the transformed matrix.

The other procedure, developed on the basis of Tucker's (1966) article is as follows:

The two matrices A and B defined above, both are of size 150 x 5, where 150 is the number of items and 5 is the number of factors. Another two matrices C and D are formed by changing the signs of the elements of matrices A and B respectively. It means $C = -A$ and $D = -B$. Matrices A and C are combined together, and matrices B and D are combined together to form another two matrices E and F of sizes 300 x 5 each such that

$$E = \begin{bmatrix} A \\ C \end{bmatrix} \quad \text{and} \quad F = \begin{bmatrix} B \\ D \end{bmatrix}$$

Using 5 columns of matrix E as a set of 5 variables and 300 rows as observations, and 5 columns of matrix F as another set of 5 variables with 300 observations, canonical analysis was done. Out of 5 canonical correlations, 2 were greater than 0.5. The number of canonical correlations greater than 0.5 indicates the number of matching factors between the two factor matrices A and B.

Corresponding to each canonical correlation there is a set of two un-normalized vectors of beta weights. Taking two sets of vectors of beta wights corresponding to the canonical correlations great than 0.5, two matrices were formed as follows:

$$T_A = \left[\underline{a}_1 \; \underline{a}_2\right] \quad \text{and} \quad T_B = \left[\underline{b}_1 \; \underline{b}_2\right]$$

where $\underline{a}_1$, $\underline{a}_2$ are un-normalized vectors of beta weights corresponding

to A and $\underline{b}_1, \underline{b}_2$ corresponding to B. T_A and T_B are transformation matrices both of size 5 x 2. Original factor matrices A and B were post-multiplied by the transformation matrices T_A and T_B respectively. The resulting matrices were two factor matrices after one oblique rotation. The resulting matrices were

$$AT_A = A^* \quad \text{and} \quad BT_B = B^*$$

The two rotated factor matrices A* and B* both of size 150 x 2 were combined to form a new factor matrix G of size 300 x 2 such that

$$G = \begin{bmatrix} A^* \\ B^* \end{bmatrix}$$

In matrix G of size 300 x 2, 2 is the number of matching factors and the first 150 items are the items of matrix A* and the next 150 items are the items of matrix B*. The two factors of matrix G were rotated by the varimax rotation. In the final rotated matrix the factor loadings of the first 150 items on each factor are comparable with the factor loadings of another set of 150 items on the same factor.

The five factors extracted were given a varimax rotated solution and were then compared subjectively with the five factors of the English version for content analysis.

RESULTS

The factors of the target matrix as well as of the transformed matrix are presented in Table 1. Items with factor loadings of .42 or greater for the target matrix and .41 or greater for the transformed matrix are reported. The levels of .42 and .41 were chosen since these are the minimum values at which the items did not overlap on the scales. Using the level of .42 the target matrix has five significant factors but using the level of .41 for the transformed matrix, there are only three significant factors. Therefore, only three factors of both the

Table 1. Factors I, II and III of the Target Matrix and the Transformed Matrix. (Significant loadings are reported)

Factor I			Factor II			Factor III		
Item No	Target Matrix	Transformed Matrix	Item No	Target Matrix	Transformed Matrix	Item No	Target Matrix	Transformed Matrix
1	—	-.42	9	—	.44	13	.56	.47
6	—	.41	18	—	.41	27	.52	—
19	.59	.60	20	.43	—	47	.44	.44
21	.55	.50	34	.42	—	52	—	.43
23	.47	.51	99	.48	—	58	—	.56
24	.46	.51	119	.46	—	72	.46	—
35	.61	.53	121	.49	.43	75	—	.49
36	.50	—	124	.44	—	81	.42	—
38	—	-.53	131	.51	—	84	—	.46
52	.44	—	132	.49	—	85	.45	—
54	.44	.46	133	.44	—	86	.49	.44
62	—	-.42	134	.47	—	88	.51	.43
63	.46	.44	136	.47	—	103	.44	—
65	.51	.61	137	.48	—	115	.51	—
75	.44	—	141	.50	—	118	.49	—
76	.57	.60	144	.51	—	129	.42	—
79	—	.41	149	.55	—			
80	.60	.60						
90	—	-.47						
92	.44	—						
94	—	.54						
101	—	-.45						
109	.53	.51						
110	.49	.42						
114	.47	—						
116	.54	.50						
126	.65	.61						
128	.45	—						

matrices are reported in Table 1. The congruence coefficients of the five factors for the two matrices were 0.72, 0.59, 0.66, 0.39 and 0.61. According to the criterion, if the coefficients for a given factor in the target matrix are exactly proportional to those for the corresponding factor of transformed matrix, the congruence coefficient will be unity. Coefficients of .9 or more indicate good correspondence; from .8 to .9 indicates fair correspondence; from .7 to .8 indicates poor correspondence; while less than .7 indicates practically no correspondence. In the present case the coefficient of congruence for the first factor is .72 indicating that there is poor correspondence between the first factors of the two matrices. The other coefficients are less than .7 which indicates that there is no correspondence between the other factors of the two matrices. Factor I of the target matrix has 20 items which have loadings equal to .42 or greater and the factor I of the transformed matrix has 22 items which have loadings equal to .41 or greater. Fourteen items are common to factor I of both the matrices, which is 70% of the items of factor I of the target matrix. Factor II has only one item common. Factor III has 4 items common, which is nearly one third of the items of factor III of the target matrix.

Using the other technique for comparing the five factors of the English version with the five factors of the French version, the five canonical correlations were .92, .60, .46, .19 and .08. Only two canonical correlations are greater than .5; therefore, only two factors of the English version are comparable with the two factors of the French version. Two comparable factors of both the matrices are given in Table 2. Items with factor loadings of 1.46 or greater which is the minimum value at which the items did not overlap on the scales, are reported. U.S. factor I has 26 items which have loadings equal to 1.46 or greater and the corresponding Quebec factor I has 18 items. Fifteen items are common to factor I of both the matrices, which is 57.7% of the items of factor I of the U.S. matrix and 83.3% of the items of factor I of the Quebec matrix. U.S. factor II has 23 items which have loadings equal to 1.46 or greater and the corresponding Quebec factor II has 25 items. Six

Table 2. Two Matching Factors of the English and French versions corresponding to the canonical Correlations greater than .5.
(Significant loadings are reported)

Factor I			Factor II		
Item No	U.S.A.	Quebec	Item No	U.S.A.	Quebec
13	1.50	——	1	——	1.87
19	1.84	2.03	4	——	1.52
21	2.16	1.49	9	1.59	1.82
23	1.85	1.69	15	——	1.68
24	1.60	1.74	18	——	1.84
35	2.03	1.91	20	1.91	——
36	1.90	——	26	——	1.75
50	1.68	1.80	34	1.48	——
52	2.01	——	36	——	1.54
54	1.75	1.83	38	——	1.57
63	1.74	1.58	39	1.68	——
65	1.82	2.25	40	1.53	——
75	1.92	——	41	1.80	——
76	2.04	2.18	42	——	1.57
79	——	1.56	53	1.72	——
80	1.94	2.31	58	1.58	——
82	1.53	——	60	1.47	——
84	1.58	——	62	——	2.03
85	1.68	——	64	2.05	——
86	——	1.46	68	——	1.90
92	1.47	——	70	——	1.69
94	——	1.79	71	——	1.93
104	1.83	——	78	1.70	——
108	1.59	——	81	——	1.53
109	2.04	2.03	83	——	1.51
110	2.06	1.60	89	1.69	——
114	1.72	——	90	——	2.11
116	2.05	2.15	91	1.50	1.65
126	2.23	2.11	93	——	2.0
			97	2.12	1.51
			99	1.69	——
			101	——	2.67
			121	1.69	1.57
			123	1.78	——
			130	1.53	1.51
			141	1.80	——
			142	——	1.70
			144	1.58	——
			145	1.46	1.68
			146	——	1.67
			147	1.56	——
			149	2.24	——

items are common to factor II of both the matrices, which is 26.1% of the items of factor II of the U.S. matrix and 24% of the items of factor II of the Quebec matrix, indicating that about one fourth of the items are common to factor II.

With the results of comparing factors of both the techniques, it is clear that the factor contents of the two versions are different and there is little resemblance. It suggests that the French version of the MTAI does not give the same measure of attitudes as its English version and therefore its factor contents should be defined as for the English version. The following section is meant for this purpose.

For the comparision of the French version with the English version subjectively, five varimax rotated factors were used. Items with factor loadings of .37 or greater which is the minimum value at which the items did not overlap on the scales, were considered for interpretation. A total of 70 items had loadings of .37 or greater and were used to define the factors. The English version had a total of 60 items with loadings of .42 or greater for defining the factors. The five factors accounted for 22% of the total variance while the five factors of the English version accounted for 25% of the total variance.

Factor I contains 21 items. It has 7 items in common with U.S. Factor III which was titled "Rigidity and Severity in Handling Pupils". Items of Quebec Factor I and U.S. Factor III are given in Table 3. Quebec Factor I expresses pupil learning in a broader sense as is indicated by the statements: more studing at home, to learn to obey the teacher, to learn that teacher knows best, to learn not to rebel against authority, should read by the age of seven, etc. Agreeing with the statements would suggest that the children should be disciplined and should obey the teacher without questioning. Teacher is concerned about such things as discipline problems, aggressive children, use of slang, throwing of chalk and erasers, lack of application, grading, classroom rules and regulations, writing obscene notes, etc. As is clear from

Table 3. Quebec Factor I - Pupil Learning Based on Discipline, Obedience and Absolute Teacher Authority.

U.S. Factor III - Rigidity and Severity in Handling Pupils.

(Significant loadings are reported)

Item No	Quebec Factor I			U.S. Factor III
	Loading	Mean	S.D.	Loading
12	.38	-.41	1.14	—
13	.46	-.79	1.05	.56
27	—	—	—	.52
47	.45	-.15	1.01	.44
48	.38	-.49	.93	—
50	.48	.29	.99	—
51	.39	-.10	1.14	—
52	.49	-.26	1.12	—
55	.40	.10	1.08	—
58	.54	.25	1.12	—
66	.38	-.78	.91	—
72	—	—	—	.46
75	.48	-.01	1.05	—
81	.37	.24	1.15	.42
84	.43	.39	1.00	—
85	—	—	—	.45
86	.50	-.47	1.10	.49
88	.47	.29	1.04	.51
95	.37	-.24	1.05	—
103	—	—	—	.44
108	.42	-.05	1.07	—
112	.40	.21	1.01	—
115	.39	-.22	1.03	.51
118	.40	-.37	.92	.49
120	.37	-.66	.94	—
129	—	—	—	.42

Table 3, most of the means of the items for this factor are negative and the standard deviations are around one. It means that although there is a great variation but on the whole Quebec teachers disagree with the statements of this factor. The resemblance of this factor with U.S. Factor III is that both factors prescribe the manner in which teachers should handle pupils with specific references, especially to obedience and acquiescence.

Factor II contains 24 items and it resembles U.S. Factors I and V combined which contain 20 and 6 items respectively. These are represented in Table 4. It has 14 items in common with U.S. Factor II and 5 items in common with U.S. Factor V. U.S. Factors I and V were titled "Children's Irresponsible Tendencies and Lack of Self-Discipline", and "Pupils Acquiescence to the Teacher" respectively. This is a bipolar factor - irresponsibility versus responsibility. Out of 24 items 19 items which have positive loadings on the factor measure irresponsibility while the remaining five items which have negative loadings measure responsibility. There is an overall negativism in the statements of irresponsibility such as expecting too much help, do not make an effort, have their own way, lack common courtesy, are too care free, are thoughtless, very boring, more irritating, too frivolous, like to annoy, etc. The statements of responsibility do not have negativism as, are obedient, take their responsibilities seriously, make things easier, are considerate, etc. The negative loadings indicate that those teachers who favor irresponsibility on the part of the children do not favor responsibility at the same time and this is logical. The means and standard deviations of the items of this factor are also given in Table 4. Out of five items in the category of responsibility, four have positive means, indicating that Quebec teachers on the whole agree with these statements. In the category of irresponsibility 9 items have negative means while 10 items have positive means.

Factor III has 9 items and it does not have items in common with any U.S. Factor except one item which is also contained in U.S. Factor IV. U.S. Factor IV was titled "Pupils' Independence in Learning". The

Table 4. Quebec Factor II - Pupils' Irresponsibility Versus Responsibility.
U.S. Factor I - Children's Irresponsible Tendencies and Lack of Self-Discipline.
U.S. Factor V - Pupils' Acquiescence to the Teacher.
(Significant loadings are reported)

Item No	Quebec Factor II			U.S. Factor I	U.S. Factor V
	Loading	Mean	S.D.	Loading	Loading
1	-.48	.76	.98	—	.44
19	.56	-.29	1.13	.59	—
21	.48	.82	.99	.55	—
23	.44	.78	1.04	.47	—
24	.43	1.04	.96	.46	—
35	.45	.07	1.10	.61	—
36	—	—	—	.50	—
38	-.50	.49	1.00	—	—
52	—	—	—	.44	—
54	.54	.03	1.16	.44	—
63	.50	-.56	.89	.46	—
65	.58	-.09	1.04	.51	—
68	-.41	.21	1.01	—	—
75	—	—	—	.44	—
76	.63	.21	1.03	.57	—
79	.51	-.37	.95	—	—
80	.61	-.31	.98	.60	—
90	-.41	-.09	.95	—	.49
92	—	—	—	.44	—
94	.55	-.27	.90	—	—
98	.43	.18	1.03	—	—
101	-.48	.57	.90	—	.56
107	.44	.98	.85	—	.52
109	.51	-.20	.99	.53	—
110	.49	-.46	.83	.49	—
113	.38	-.50	.82	—	.44
114	—	—	—	.47	—
116	.57	.12	1.02	.54	—
126	.50	.14	1.03	.65	—
128	—	—	—	.45	—
146	—	—	—	—	.42

loadings of Factor III and of U.S. Factor IV are given in Table 5. This factor describes an attitude that is relaxed and cares for pupil's freedom. Items involving concepts as, more freedom, think themselves if permitted, give reasons for the restrictions, the right to disagree openly, etc., indicate that the teacher favoring these statements respects for pupil's autonomy. Negative scores on this factor suggest that the teacher does not agree to allowing freedom to the children. The means and standard deviations of the items given in Table 5 suggest that Quebec teachers agree very strongly with the statements. Most of the means are greater then one while most of the standard deviations are less than one.

Factor IV contains 13 items and it has 6 items in common with U.S. Factor which had 15 items and was titled "Conflict between Teachers' and Pupils' Interests". The loadings of Factor IV and of U.S. Factor II are given in Table 6. In this factor the statements such as shyness is preferable, keep his likes and dislikes to himself, never discuss sex problems, it is better to be bashful, need not understand the reasons for social conduct, no business asking questions about sex, cannot be trusted, etc., if favored, would suggest teacher's mistrust of children's open behavior and indicate a conservative attitude. The means of the items given in Table 6 indicate that the Quebec teachers do not agree with these statements. All the means except one are negative.

Factor V has three items only, item numbers 20, 77 and 140, with factor loadings .45, .40 and -.44 respectively. This is also a bipolar factor, i.e., teachers agreeing with the first two items do not agree with the third and vice versa. This fact is confirmed with the item means also. The means for the first two items are positive, .51 and .30, respectively while the means for the 3rd item is negative, -.16. Favoring the first two statements and not the third indicate the teacher's lack of emotional involvement with pupils.

Table 5. Quebec Factor III - Teacher's Respect for Pupil's Autonomy.
U.S. Factor IV - Pupils' Independence in Learning.
(Significant loadings are reported)

Item No	Quebec Factor III			U.S. Factor IV
	Loading	Mean	S D.	Loading
15	—	—	—	.42
16	—	—	—	.43
53	—	—	—	.44
64	—	—	—	.47
71	.41	.88	.74	.47
77	—	—	—	.46
93	—	—	—	.54
127	.38	1.16	.71	—
130	.45	1.16	.74	—
133	.46	1.49	.68	—
142	.43	.75	.81	—
144	.51	1.29	.78	—
145	.47	1.16	.89	—
146	.42	.60	1.02	—
147	.44	1.05	.78	—

Table 6. Quebec Factor IV - Teacher's Mistrust of Children's Open Behavior.
U.S. Factor II - Conflict Between Teachers' and Pupils' Interests.
(Significant loadings are reported)

Item No	Quebec Factor IV			U.S. Factor II
	Loading	Mean	S.D.	Loading
4	.39	.44	1.12	—
9	.43	-1.47	.79	—
18	.44	-.96	.78	—
20	—	—	—	.43
34	—	—	—	.42
36	.38	-.68	1.06	—
44	.38	-.63	.91	—
73	.39	-.53	1.03	—
83	.38	-.96	.74	—
99	.40	-1.14	.65	.48
119	.42	-1.28	.66	.46
121	.46	-.83	.99	.49
124	—	—	—	.44
131	.42	-.71	.90	.51
132	.37	-1.05	.70	.49
133	—	—	—	.44
134	—	—	—	.47
136	—	—	—	.47
137	—	—	—	.48
141	—	—	—	.50
144	—	—	—	.51
149	.37	-.91	.80	.55

DISCUSSION

With the empirical as well as subjective comparisons of factor contents of the two factor matrices, it is clear that the correspondence is not perfect between the factor structures of attitudes of teachers of the two cultures. But it is also certain that the empirical comparisons show less similarity than the subjective comparison or the similarity that really exists. The reason is that empirical comparisons take into consideration the correspondence between the items of the two factor matrices and ignore the fact that out of 150 items of the inventory less than half of the items compose the factor structure. Items that are not included in the factor content may have low reliability and may not have common content with other items. Moreover, there are several items measuring the same content but some are included in the factor structure of one culture while others are included in the factor structure of the other culture, showing similarity of content between the two with different items. It can also happen if the factor analysis is repeated for the same culture but on a different sample. Therefore, a subjective comparison may be closer to the actual similarity of content between the two.

There is similarity between the Quebec Factor I and the U.S. Factor III in the sense that the items of both the factors if favored by a teacher will indicate that the teacher is authoritarian and believes in strict discipline. The teacher may be worried about the activities of the pupils and therefore he believes in using severe means of handling them.

The items of Quebec Factor II and U.S. Factor I and V are also similar in content. The items deal with the responsibility and irresponsibility of pupils. The items of U.S. Factor I deal with the irresponsibility of pupils and the items of Factor V may be considered dealing with responsibility. It is interesting to note that the teachers who agree with the irresponsibility of pupils may not agree at the same time with their responsibility.

'hough the Quebec Factor III and U.S. Factor IV do not have items in common but still there is some similarit, of contents between the two. If the statements are favored then it suggests that the teacher believes in pupils' autonomy or independence and is a liberal attitude. Items in Quebec Factor deal with pupil's autonomy in general while items in U.S. Factor deal with pupils' independence in learning.

The similarity between the Quebec Factor IV and the U.S. Factor II could be that if the statements are favored both the factors will indicate a conservative attitude of the teacher. But the conservative attitude in what context is entirely different for the two factors. Quebec Factor IV in a sense is opposite to the Quebec Factor III, i.e. those who agree with the statements of Factor III disagree with the statements of Factor IV.

Quebec Factor V is entirely different and it does not have any correspondence with any U.S. Factor. As this factor has very few items, it may not be considered a very stable factor, and its interpretation should be done with caution.

From the subjective comparison of factor contents of the two cultures it seems that nearly 50% of the contents are common to the two cultures. Now it will be interesting to see how the difference in attitude of teachers of the two cultures might make a difference in the classroom relationship.

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